

What is claimed is:

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1. An isolated protein comprising a parasite astacin metalloendopeptidase protein.
 2. The protein of Claim 1, wherein said protein, when administered to an animal in an effective manner, elicits an immune response against a parasite astacin metalloendopeptidase.
 3. The protein of Claim 1, wherein said parasite is selected from the group consisting of parasitic helminths, protozoan parasites and ectoparasites.
 4. The protein of Claim 1, wherein said parasite comprises a tissue-migrating helminth.
 5. The protein of Claim 1, wherein said parasite is selected from the group consisting of nematodes, cestodes and trematodes.
 6. The protein of Claim 1, wherein said parasite comprises a nematode selected from the group consisting of filariid, ascarid, strongyle and trichostrongyle nematodes.
 7. The protein of Claim 1, wherein said parasite comprises a filariid nematode selected from the group consisting of *Dirofilaria*, *Acanthocheilonema*, *Brugia*, *Dipetalonema*, *Loa*, *Onchocerca*, *Parafilaria*, *Setaria*, *Stephanofilaria* and *Wuchereria* filariid nematodes.

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8. The protein of Claim 1, wherein said parasite comprises *D. immitis*.

9. The protein of Claim 1, wherein said protein is encoded by a parasite nucleic acid molecule which hybridizes under stringent conditions with a *D. immitis* astacin metalloendopeptidase gene.

10. The protein of Claim 1, wherein said protein comprises an amino acid sequence having at least about 40 percent homology with an amino acid sequence selected from the group consisting of SEQ ID NO:31 and SEQ ID NO:34.

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11. The protein of Claim 1, wherein said protein comprises at least a portion of at least one amino acid sequence selected from the group consisting of SEQ ID NO:3, SEQ ID NO:4, SEQ ID NO:5, SEQ ID NO:6, SEQ ID NO:7, SEQ ID NO:8, SEQ ID NO:9, SEQ ID NO:10, SEQ ID NO:31 and SEQ ID NO:34, wherein said portion is encoded by a nucleic acid molecule which hybridizes under stringent conditions with a nucleic acid molecule selected from the group consisting of nDiMPA1₁₂₉₉, nDiMPA2₂₁₂₆, L3 nDiMPA3₂₂₉₂, L3 nDiMPA3₂₀₇₆, adult nDiMPA3₂₀₃₂, and adult nDiMPA3₂₀₄₈.

12. The protein of Claim 1, wherein said protein comprises an extended zinc-binding domain motif.

5 13. The protein of Claim 1, wherein said protein is produced by a process comprising culturing in an effective medium a recombinant cell transformed with a nucleic acid molecule encoding said protein to produce said protein.

~~14. The protein of Claim 1, wherein said protein is used to identify an inhibitor of astacin metalloendopeptidase activity.~~

15. An isolated antibody capable of selectively binding to a protein set forth in Claim 1.

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16. A therapeutic composition for protecting an animal from disease caused by a parasite, said parasite being susceptible to an inhibitor of an astacin metalloendopeptidase, said therapeutic composition comprising at least one protective compound selected from the group consisting of: an isolated parasite astacin metalloendopeptidase protein; an anti-parasite astacin metalloendopeptidase antibody; and an inhibitor of astacin metalloendopeptidase activity identified by its ability to inhibit parasite astacin metalloendopeptidase activity of said protein.

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17. The composition of Claim 16, wherein said composition further comprises at least one component selected from the group consisting of an excipient, an adjuvant and a carrier.

18. The composition of Claim 16, wherein said parasite comprises a tissue-migrating helminth.

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19. The composition of Claim 16, wherein said disease comprises heartworm infection.

20. A method to protect an animal from disease caused by a parasite, said parasite being susceptible to an inhibitor of an astacin metalloendopeptidase, said method comprising administering to said animal a therapeutic composition comprising at least one protective compound selected from the group consisting of: an isolated parasite astacin metalloendopeptidase protein; an anti-parasite astacin metalloendopeptidase antibody; and an inhibitor of astacin metalloendopeptidase activity identified by its ability to inhibit parasite astacin metalloendopeptidase activity of said protein.

21. The method of Claim 20, wherein said parasite comprises a tissue-migrating helminth.

22. The method of Claim 20, wherein said disease comprises heartworm infection.

23. A method to identify a compound capable of inhibiting astacin metalloendopeptidase activity of a parasite, said method comprising:

5 (a) contacting an isolated parasite astacin metalloendopeptidase protein with a putative inhibitory compound under conditions in which, in the absence of said compound, said astacin metalloendopeptidase protein has astacin metalloendopeptidase activity; and

(b) determining if said putative inhibitory compound inhibits said activity.

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24. A test kit to identify a compound capable of inhibiting astacin metalloendopeptidase activity of a parasite, said test kit comprising an isolated parasite astacin metalloendopeptidase protein having astacin metalloendopeptidase activity and a means for determining the extent of inhibition of said activity in the presence of a putative inhibitory compound.

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